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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,891	07/21/2003	Sanjay M. Reddy	0167.03	6885

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USDA-ARS-OFFICE OF TECHNOLOGY TRANSFER
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PEORIA, IL 61604

EXAMINER	
MCGAW, MICHAEL M	
ART UNIT	**PAPER NUMBER**
1648	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/623,891	REDDY ET AL.	
	Examiner	Art Unit	
	Michael M. McGaw	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/21/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/02/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-15 are pending and under examination in the current application.

Claim Rejections - 35 USC § 112, ¶1

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 3, 5, 10 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Each of the claims listed immediately above refer to "a Marek's disease virus having all of the identifying characteristics of strain ATCC PTA-4945." Pages 6 and 7 of the specification indicate that CVRM-2 has been deposited with ATCC and an accession number (ATCC PTA-4945) is provided. However, applicant's deposit statement does not indicate the extent of public availability.

Where claims require the use of specific biological materials, enablement as to such claims mandates that the biological material must be known and readily available to the public or obtainable by a repeatable method set forth in the specification, or otherwise readily available to the public. If not so obtainable or available, the enablement requirements of 35 U.S.C. § 112, first paragraph, may be satisfied by the deposit of the antibody and the virus strain recited in the claims. See CFR 1.802. The

specification does not provide a repeatable method for obtaining these materials and it is not apparent that they are readily available the public.

Applicant's deposit statement does not indicate the extent of public availability. If the deposit is made under the terms of the Budapest treaty, then an affidavit or declaration by the applicant, or someone associated with the patent owner who is in a position to make such assurances, or a statement by an attorney of record over his or her signature, stating that the deposit is made under terms of the Budapest Treaty and that all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of a patent, would satisfy the deposit requirements. See 37 CFR 1.808. In addition, the identifying information set forth in 37 CFR 1.809(d) should be added to the specification. See CFR 1.803 through 1.809.

Claim Rejections - 35 USC § 112, ¶2

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 8-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 and 10 recite the use of a *Pac I* excised segment. It is not completely clear what is meant by the long terminal repeat being a Pac I excised DNA segment. While one might generally want to linearize a fragment in advance of recombination, the

identity of the particular restriction site would appear to be irrelevant, especially since this site would be lost during recombination. Furthermore, the choice of appropriate restriction endonucleases for excision would be based upon the availability of restriction sites in the DNA from which one sought to release the REV sequence. In this instance one would seek Pac I digestion from RM1 because RM1 happened to have the Pac I site as the most appropriate choice.

It appears that a rejection of claims 3 and 10 under 35 U.S.C. 103, as applied to claims 5 and 12 below, may be appropriate, but without fully understanding that which applicant seeks to claim examiner is not making that rejection.

Claim 8 recites a "vaccine ... in an amount effective to elicit an immune response..." The term 'vaccine' is defined as "any preparation intended for active immunologic prophylaxis" (See Stedman's Medical Dictionary, 27th Ed.) Thus, a vaccine should be administered such that it elicits a *protective* immune response, not merely an immune response. Consequently, a problem of scope exists when a "vaccine" is being administered in a quantity that is merely sufficient to elicit an immune response rather than a *protective* immune response.

Similarly, Claim 9 recites a "method for protecting a chicken against [MDV via inoculation] in an amount effective to elicit an immune response..." Again, the amount effective to elicit an immune response may not necessarily be sufficient to be protective. Claims 10-13 are dependent upon claim 9 and are therefore also rendered indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5, 6, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witter et al. (1997) in view of Witter et al. (1995).

Applicant claims a recombinant Marek's disease virus (MDV) CVI988/X that is stably transformed with the long terminal repeat sequence (LTR) of reticuloendotehelial virus (REV) where the recombinant virus is effective to elicit an immune response in a chicken to Marek's disease virus without causing a significant degree of pathogenicity in the chicken. Applicant indicates that MDV CVI988/X includes, but is not limited to, MDV CVI988 or any of its clones, including CVI988/Rispens (page 13 of the specification).

Witter et al (1997) *Avian Diseases*, **41**:407-421 discloses a recombinant MDV, referred to as RM1, based upon the JM/102W strain of MDV, which was stably transformed with the LTR of REV (page 408) (See also Jones et al, *J. Virol.* (1996) p. 2460-67 which describes more fully the creation of RM1). Witter reported that RM1 was effective to elicit an immune response in chickens (page 413) and that the response was highly protective upon challenge (Table 7 on page 418), greatly exceeding that of the attenuated serotype 1 vaccine strains CVI988 and JM/102W (upon which it was based). Witter reports that JM/102W(passage 48), like other attenuated serotype 1 MDVs, replicates poorly *in vivo* (page 418). In contrast, RM1 replicated efficiently *in*

vivo. Moreover, RM1, like the attenuated viruses often used in vaccines, did not result in significant oncogenicity (page 416). Witter speculates that the LTR insertion induced the greater *in vivo* replication, which, in turn, resulted in the increased protection in RM1 vaccinated chickens upon challenge with virulent MDV (page 418). Witter points out that RM1 is not a good candidate for commercial vaccine development due to its ability to cause persistent thymic atrophy and residual oncogenicity, but that it does represent a model for future vaccine development (page 420). In particular, Witter provides that the "selective mutation of key genes [with REV] will prove to be a useful strategy for development of superior serotype 1 vaccines." (See last sentence of text on page 420).

Witter (1997) does not teach using the CVI988 strain of MDV. Additionally, Witter's RM1 strain caused a significant degree of pathogenicity in the chicken in terms of its ability to cause thymic atrophy.

Witter et al., *Avian Diseases* (1995) **39**:269-284 reports on an attenuated serotype 1 MDV vaccine virus known as CVI988/Rispens that does not result in thymic atrophy (page 282). CVI988/Rispens resulted in the best protection when compared with other vaccines (abstract).

One of ordinary skill in the art would have been motivated to substitute the JM/102W strain of MDV as taught by Witter et al (1997) with the CVI988/Rispens as taught by Witter et al (1995) to create a recombinant MDV vaccine because Witter et al (1997) states that selective mutation with REV may be an advantageous strategy for the development of superior serotype 1 MDV vaccines. One of ordinary skill in the art would have had a reasonable expectation of success in producing a recombinant virus through

the transformation of CVI988/Rispens with REV to yield an MDV vaccine effective to elicit an immune response in a chicken to MDV without causing significant pathogenicity because MDV-REV transformants have been previously shown to be effective at eliciting an immune response while CVI988/Rispens has been shown to have the characteristic of not inducing thymic atrophy. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention.

As to claim 2 the specification indicates on page 13 that RM1 was used as the source of the REV LTR used in the present MDV recombinant. Therefore, it is reasonable to conclude that by applying the teachings of Witter et al (1997) over Witter et al (1995), as outlined above, one would produce a viral agent wherein said LTR comprises Sequence ID No. 2. Furthermore, Jones et al provides the details of the MDV RM1 vaccine virus used by Witter et al (1997) and is explicitly referenced by Witter throughout page 408. The REV LTR sequence disclosed by Jones et al in Fig. 1 on page 2461 is identical to Sequence ID No. 2 as provided by applicant.

As to claims 5, 6, 7, 12 and 13, it is reasonable to conclude that by applying the teachings of Witter et al (1997) over Witter et al (1995), as outlined above, one would produce a viable (see claims 6 and 13) MDV viral agent *having all of the identifying characteristics* of ATCC PTA-9495 (see claims 5 and 12). Furthermore, cell-association is widely regarded as a property of many enveloped viruses including those in the family Herpesviridae (see claim 7). For instance, Jones et al, *J. Virol.* (Apr. 1996) p. 2460-67, indicates on page 2460, 1st paragraph of the Materials and Methods section, that MDV

is typically cell-associated when propagated *in vitro*. Thus, one would expect any MDV virus to be cell-associated as an inherent property of the virus and irrespective of the REV LTR insert.

Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witter et al (1997) over Witter et al (1995) as applied to claims 1 and 9 above, and further in view of Jones et al (1996). Jones et al provides the details of the MDV RM1 vaccine virus used by Witter et al (1997) and is explicitly referenced by Witter throughout page 408. In particular, Jones teaches that the insertion of the LTR is upstream of the MDV ICP4 gene (see pg. 2466; col.1; last full sentence).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. McGaw whose telephone number is (571) 272-2902. The examiner can normally be reached on Monday through Friday from 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel can be reached on (571) 272-0902. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monday, May 31, 2004

JAMES HOUSEL
SUPERVISORY PATENT EXAMINER
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